

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference M02B154 PCT/ASB	FOR FURTHER ACTION <small>see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.</small>	
International application No. PCT/GB 03/04415	International filing date (day/month/year) 10/10/2003	(Earliest) Priority Date (day/month/year) 14/10/2002
Applicant THE BOC GROUP PLC		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 7 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

a. With regard to the language, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item:

☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

b. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international search was carried out on the basis of the sequence listing:

☐ contained in the international application in written form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

2. ☐ Certain claims were found unsearchable (See Box I).

3. ☐ Unity of invention is lacking (See Box II).

4. With regard to the title:

☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows:

5. With regard to the abstract:

☒ the text is approved as submitted by the applicant.

☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the drawings to be published with the abstract is Figure No.

☒ as suggested by the applicant.

☐ because the applicant failed to suggest a figure.

☐ because this figure better characterizes the invention.

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☐ None of the figures.

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Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this International application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☒ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
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4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☒ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-23, 26-31

A pump with thermal control means and a method for controlling the clearance between a rotor and a stator in such a pump.

2. claim: 24

A valve with flow restrictors and signal receptors.

3. claim: 25

A method for releasing the rotors of a pump that have seized.

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International Application No.

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A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 F04C29/04 F04C18/16 F04C18/12 F04C29/10

According to International Patent Classification (IPC) or to both national classification and IPC.

B. FIELDS SEARCHED

Maximum documentation searched (classification system followed by classification symbols)

IPC 7 F04C F01C

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P, X	WO 03/042542 A (LEYBOLD VAKUUM GMBH BEHLING MANERED (DE); KRIEHN HARTMUT (DE), RO) 22 May 2003 (2003-05-22) the whole document	1-14, 20-22, 26, 29-31
X	US 4 983 106 A (WRIGHT DAN ET AL) 8 January 1991 (1991-01-08)	1-3, 26, 29-31
Y	the whole document	23
Y	DE 198 20 523 A (FRIEDEN PETER) 11 November 1999 (1999-11-11) figure 3	23

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

Special categories of cited documents:

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

- *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principles or theory underlying the invention
- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents; such combination being obvious to a person skilled in the art
- *Z* document member of the same patent family

Date of the actual completion of the international search

1 March 2004

Date of mailing of the international search report

05. 03. 2004

Name and mailing address of the ISA

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NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx 31 861 epo.nl
Fax (+31-70) 340-3016

Authorized officer

Dimitroulas, P

INTERNATIONAL SEARCH REPORT

International Application No.

PCT/GB 03/04415

C. (Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	PATENT ABSTRACTS OF JAPAN vol. 2000, no. 03, 30 March 2000 (2000-03-30) & JP 11 336684 A (HITACHI LTD), 7 December 1999 (1999-12-07) abstract	1, 2, 26
A	PATENT ABSTRACTS OF JAPAN vol. 008, no. 238 (M-335), 31 October 1984 (1984-10-31) & JP 59 115492 A (HITACHI SEISAKUSHO KK), 3 July 1984 (1984-07-03) abstract	1, 23, 26
A	US 4 983 107 A (STEFFENS RALF ET AL) 8 January 1991 (1991-01-08) the whole document	1, 23, 26
A	PATENT ABSTRACTS OF JAPAN vol. 1995, no. 02, 31 March 1995 (1995-03-31) & JP 06 330875 A (SEIKO SEIKI CO LTD), 29 November 1994 (1994-11-29) abstract	1, 23, 26
A	PATENT ABSTRACTS OF JAPAN vol. 017, no. 544 (M-1489), 30 September 1993 (1993-09-30) & JP 05 149287 A (HITACHI LTD; OTHERS: 01), 15 June 1993 (1993-06-15) abstract	1, 23, 26
A	PATENT ABSTRACTS OF JAPAN vol. 1998, no. 02, 30 January 1998 (1998-01-30) & JP 09 268993 A (TOCHIGI FUJI IND CO LTD), 14 October 1997 (1997-10-14) abstract	1, 23, 26
X	GB 1 160 551 A (KEALY) 6 August 1969 (1969-08-06) the whole document	24
X	DE 23 05 502 A (BAEHR THOMAS) 15 August 1974 (1974-08-15) the whole document	24
X	DE 32 03 322 A (HILBERS HEINRICH) 22 September 1983 (1983-09-22) the whole document	24
X	US 4 294 402 A (VOLLMER RUDOLF) 13 October 1981 (1981-10-13) the whole document	24

INTERNATIONAL SEARCH REPORT

International Application No.
PCT/GB 03/04415

C (Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DE 29 26 599 A (BATTELLE INSTITUT E. V.) 15 January 1981 (1981-01-15) the whole document	24
X	DE 23 41 526 A (SAMSON APPBAU AG) 20 March 1975 (1975-03-20) the whole document	24
X	EP 0 827 057 A (DEUTSCH ZENTR LUFT & RAUMFAHRT) 4 March 1998 (1998-03-04) the whole document	24
A	GB 2 081 845 A (TRUCKTONICS LTD) 24 February 1982 (1982-02-24) the whole document	24

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No.

PCT/GB 03/04415

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
WO 03042542	A	22-05-2003	DE 10156179 A1 WO 03042542 A1	28-05-2003 22-05-2003
US 4983106	A	08-01-1991	FR 2637655 A1 AT 93010 T DE 68908323 D1 DE 68908323 T2 EP 0362757 A2 ES 2042922 T3 JP 2149791 A	13-04-1990 15-08-1993 16-09-1993 09-12-1993 11-04-1990 16-12-1993 08-06-1990
DE 19820523	A	11-11-1999	DE 19820523 A1	11-11-1999
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JP 59115492	A	03-07-1984	NONE	
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JP 09268993	A	14-10-1997	NONE	
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DE 3203322	A	22-09-1983	DE 3203322 A1	22-09-1983
US 4294402	A	13-10-1981	DE 2747969 A1 BE 871531 A1 CA 1106813 A1 DK 476578 A EP 0001615 A1 IT 1160012 B	10-05-1979 15-02-1979 11-08-1981 27-04-1979 02-05-1979 04-03-1987
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DE 2341526	A	20-03-1975	DE 2341526 A1	20-03-1975
EP 0827057	A	04-03-1998	DE 19635339 A1 EP 0827057 A1	05-03-1998 04-03-1998
GB 2081845	A	24-02-1982	NONE	

Annex to Form PCT/ISA/206
COMMUNICATION RELATING TO THE RESULTS
OF THE PARTIAL INTERNATIONAL SEARCH

International Application No.
PCT/GB 03/04415

1. The present communication is an Annex to the invitation to pay additional fees (Form PCT/ISA/206). It shows the results of the international search established on the parts of the international application which relate to the invention first mentioned in claims Nos. 1-23, 26-31.
2. This communication is not the international search report which will be established according to Article 18 and Rule 43.
3. If the applicant does not pay any additional search fees, the information appearing in this communication will be considered as the result of the international search and will be included as such in the international search report.
4. If the applicant pays additional fees, the international search report will contain both the information appearing in this communication and the results of the international search on other parts of the international application for which such fees will have been paid.

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P, X	WO 03 042542 A (LEYBOLD VAKUUM GMBH, BEHLING MANFRED (DE); KRIEHN HARTMUT (DE); RO) 22 May 2003 (2003-05-22) the whole document	1-14, 20-22, 26, 29-31
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- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

- *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
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Annex to Form PCT/ISA/206
COMMUNICATION RELATING TO THE RESULTS
OF THE PARTIAL INTERNATIONAL SEARCH

International Application No.
PCT/GB 03/04415

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